

CLAIMS

What is claimed is:

1. A data driver for driving data lines of an electro-optic device, comprising:

a state setting register, to which are input setting data for one of multiple states, which include a display ON state, in which drive power is generated and display operation is conducted using drive signals based on display data, a display OFF state, in which drive power is generated but display operation using the drive signals is not conducted, and a sleep state, in which drive power is not generated and display operation using the drive signals is not conducted;

a state setting circuit, which effects transition to any of the multiple states in accordance with the setting data input to the state setting register and outputs a drive control signal associated with a state of a transition destination; and

a drive circuit, which drives the data lines with the drive power based on the drive control signal;

wherein the state setting circuit effects transition from the sleep state to the display OFF state when first setting data are input to the state setting register during the sleep state, and the state setting circuit effects transition from the sleep state to the display OFF state, then effects transition from the display OFF state to the display ON state when second setting data are input to the state setting register and is followed by input of the first setting data to the state setting register during the sleep state.

2. The data driver according to claim 1, further comprising:

a counter, which counts frame pulses having a scan cycle of scan lines of the electro-optic device,

wherein, when the second setting data is input to the state setting register and is followed by input of the first setting data to the state setting register during the sleep state, if the state setting circuit effects transition from the sleep state to the display OFF state, then starts the counting by the counter, and the count value reaches a predetermined number, the state setting circuit effects transition from the display OFF state to the display ON state.

3. The data driver according to claim 2, wherein the predetermined number is a product of f and Y , wherein,

f is a frequency in Hertz of the frame pulses, and

Y is a period in milliseconds for a power circuit for generating the drive power to stabilize after starting up, or for an oscillating circuit that outputs a clock for generating the frame pulses to stabilize after starting oscillation operation.

4. A data driver for driving data lines of an electro-optic device, comprising:

a state setting register, to which are input setting data for one of multiple states, which include a display ON state, in which drive power is generated and display operation is conducted using drive signals based on display data, a display OFF state, in which drive power is generated but display operation using

the drive signals is not conducted, and a sleep state, in which drive power is not generated and display operation using the drive signals is not conducted;

a state setting circuit, which effects transition to any of the multiple states in accordance with the setting data input to the state setting register and outputs a drive control signal associated with a state of a transition destination; and

a drive circuit, which drives the data lines with the drive power based on the drive control signal;

wherein the state setting circuit effects transition from the sleep state to the display OFF state when first setting data are input to the state setting register during the sleep state, and the state setting circuit effects transition from the sleep state to the display OFF state, then effects transition from the display OFF state to the display ON state when third setting data are input to the state setting register during the sleep state.

5. The data driver according to claim 4,

wherein the state setting circuit effects transition from the display OFF state to the sleep state when fourth setting data is input to the state setting register during the display OFF state, and the state setting circuit effects transition from the display ON state to the display OFF state, then effects transition from the display OFF state to the sleep state when the fourth setting data are input to the state setting register during the display ON state.

6. A data driver for driving data lines of an electro-optic device, comprising:

a state setting register, to which are input setting data for one of multiple states, which include a display ON state, in which drive power is generated and display operation is conducted using drive signals based on display data, a display OFF state, in which drive power is generated but display operation using the drive signals is not conducted, and a sleep state, in which drive power is not generated and display operation using the drive signals is not conducted;

a state setting circuit, which effects transition to any of the multiple states in accordance with the setting data input to the state setting register and outputs a drive control signal associated with a state of a transition destination; and

a drive circuit, which drives the data lines with the drive power based on the drive control signal;

wherein the state setting circuit effects transition from the display OFF state to the sleep state when fourth setting data are input to the state setting register during the display OFF state, and the state setting circuit effects transition from the display ON state to the display OFF state, then effects transition from the display OFF state to the sleep state when fourth setting data are input to the state setting register during the display ON state.

7. An electro-optic device, comprising:

a plurality of scan lines;

a plurality of data lines;

a plurality of pixels, which are coupled to the plurality of scan lines and the plurality of data lines;

a scan driver for scanning the plurality of scan lines; and
the data driver according to claim 1 for driving the plurality of data lines.

8. An electro-optic device, comprising:

a display panel, which includes a plurality of scan lines, a plurality of data lines, and a plurality of pixels coupled to the plurality of scan lines and the plurality of data lines;

a scan driver for scanning the plurality of scan lines; and
the data driver according to claim 1 for driving the plurality of data lines.

9. The data driver according to claim 1,

wherein the state setting circuit effects transition from the display OFF state to the sleep state when fourth setting data is input to the state setting register during the display OFF state, and the state setting circuit effects transition from the display ON state to the display OFF state, then effects transition from the display OFF state to the sleep state when the fourth setting data are input to the state setting register during the display ON state.